

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/13018

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ C07H15/203, 13/06, A61K31/7024, 31/375, 7/00, 7/48, 31/201,
31/7034, A61P17/00, 43/00, C12N9/99, C12P19/00, 19/44//
(C12P19/00, C12R1:72), (C12P19/44, C12R1:72)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ C07H15/203, 13/06, A61K31/7024, 31/375, 7/00, 7/48, 31/201,
31/7034, A61P17/00, 43/00, C12N9/99, C12P19/00, 19/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

REGISTRY (STN), CAPLUS (STN), CAOLD (STN), BIOSIS (STN), WPIDS (STN), JICST (JOIS)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/79241 A1 (HENKEL KOMMANDITGESELLSCHAFT.	1, 7, 13-17
Y	AUF AKITIONEN,	11, 12
A	25 October, 2001 (25.10.01), Particularly, Beispiel 3 & DE 10019255 A1	2-6, 8
X	Nobuyoshi NAKAJIMA et al., Lipase-Catalyzed Direct and Regioselective Acylation of Flavonoid Gluco side for Mechanistic Investigation of Stable Plant Pigments, Journal of Bioscience and Bioengineering, 1999, Vol.87, No.1, pages 105 to 107, particularly, table 1	1, 9, 13-17
Y		11, 12
A		2-6, 8

Further documents are listed in the continuation of Box C. See patent family annex.

- * Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search
07 January, 2004 (07.01.04)

Date of mailing of the international search report
27 January, 2004 (27.01.04)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Faxsimile No.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	L. VEROTTA, et al., Polyphenolic Glycosides from African Proteaceae, Journal of Natural Products, 1999, Vol.62, No.11, pages 1526 to 1531, compound 1	1, 9, 13-17 11, 12 2-6, 8
X	Koji ISHIHARA et al., A chemoenzymatic synthesis of aromatic.carboxylic.acid.vinyl.esters., Journal of Molecular Catalysis B: Enzymatic, 1999, Vol.7, pages 307 to 310, particularly, scheme 2	1, 10, 13-17 11, 12 2-6, 8
Y	US 5346693 A (L'OREAL), 13 September, 1994 (13.09.94), Full text	11, 12
A	& JP 5-194181 A & EP 524109 A1 & FR 2679140 A1 & CA 2074136 A	2-6, 8
Y	US 6306376 B1 (L'OREAL), 23 October, 2001 (23.10.01), Full text	11, 12
A	& JP 11-71225 A & EP 895779 A1 & FR 2765801 A1 & CN 1208608 A	2-6, 8
X	JP 5-320152 A (Kanebo, Ltd.), 03 December, 1993 (03.12.93), Particularly, test example 1 (Family: none)	18, 21, 22
X	EP 477927 A1 (SUNSTAR KABUSHIKI KAISHA), 01 April, 1992 (01.04.92), Particularly, page 3, lines 21 to 26, formulation examples & JP 4-134012 A (page 4, lower left column, line 6th from the bottom to lower right column, line 3; examples) & US 5190758 A & CA 2052231 A1	18, 20-22
X	JP 2002-114670 A1 (Noevir Co., Ltd.), 16 April, 2002 (16.04.02), Examples 1 to 3, 5, 6, 8 (Family: none)	18, 20-22
X	JP 5-137994 A (Kanebo, Ltd.), 01 June, 1993 (01.06.93), Apprication example 2 (Family: none)	18, 19, 21, 22
X	JP 2001-322990 A (Pola Chemical Industries Inc.), 20 November, 2001 (20.11.01), Particularly, Claims; page 3, column 3, lines 21 to 24; examples 4 to 6 (Family: none)	23-25, 27-30

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No..
X	JP 5-294820 A (Takehiro YOSHIKAWA), 09 November, 1993 (09.11.93), Particularly, Claims; page 2, column 2, lines 4 to 6; example 2 (Family: none)	23-25, 27-30
X	JP 4-182415 A (Kabushiki Kaisha Kaminomoto Hompo), 30 June, 1992 (30.06.92), Particularly, Claim 1; page 5, upper left column, lines 15 to 17; examples 1 to 5 (Family: none)	23-26, 28, 30
X	JP 2001-316226 A (Yugen Kaisha Nonogawa Shoji), 13 November, 2001 (13.11.01), Particularly, Par. Nos. [0019], [0040]; example 1 (Family: none)	23-26, 28, 30
X	JP 2002-275060 A (Ichimaru Pharcos Co., Ltd.), 25 September, 2002 (25.09.02), Particularly, Par. No. [0056], example of prescription 2 (Family: none)	23-25, 27, 28, 30
X	JP 2001-158730 A (Pola Chemical Industries Inc.), 12 June, 2001 (12.06.01), Particularly, examples 1 to 8, 11, 20 (Family: none)	23-25, 27, 28, 31
X	JP 2001-151623 A (Shiseido Co., Ltd.), 05 June, 2001 (05.06.01), Particularly, Claims; example 3 (Family: none)	13-25, 27, 28, 31
X	Arto LILJEBLAD, et al., Enzymatic methods for the preparation of enantiopure malic and aspartic acid derivatives in organic solvents, Tetrahedron: Asymmetry, 1999, Vol.10, pages 4405 to 4415, particularly, table 2	32, 33
Y		34, 35
A		36
X	Nuria ARMESTO et al., Regioselective Enzymatic Acylation of Methyl Shikimate., Influence of Acyl Chain Length and Solvent Polarity on Enzyme Specificity, J.Org.Chem., 12 June, 2002 (12.06.02), Vol.67, No.14, pages 4978 to 4981, particularly, table 2	32, 33
Y		34, 35
A		36
Y	Ninfa Rangel PEDERSEN et al., Efficient transesterification of sucrose catalysed by the metallo protease thermolysin in dimethylsulfoxide, FEBS Letters, 22 May, 2002 (22.05.02), Vol.519, No.1-3, pages 181 to 184, abstract	34, 35
A		36

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	ES 2141670 A1 (CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS), 16 March, 2000 (16.03.00), Full text (Family: none)	34,35 36

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Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
(See extra sheet.)

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

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Continuation of Box No. II of continuation of first sheet(1)

I. The special technical feature of the inventions according to claims 1 to 17 resides in an arbutin ester compound represented by the general formula (1).

II. The special technical feature of the inventions according to claims 18 to 22 resides in using undecylenic acid, its salt or its ester derivative represented by the general formula (2) as a tyrosinase inhibitor.

III. The special technical feature of the inventions according to claims 23 to 31 resides in using ascorbic acid and/or an ascorbic acid derivative as a tyrosinase activity promoter.

IV. The special technical feature of the inventions according to claims 32 to 36 resides in a process for producing an esterified product using *Candida antartica*-origin lipase A.

Such being the case, it does not appear that there is a technical relationship among these invention groups I to IV involving one or more of the same or corresponding special technical features. Thus, these groups of inventions are not considered as relating to a group of inventions so linked as to form a single general inventive concept.